What is claimed is:

1. An image-processing apparatus, in which a high-frequency component signal of an original image-signal, representing a plurality of pixels, is added to either said original image-signal or a lowest frequency image-signal of said original image-signal, in order to generate a processed image-signal, comprising:

a conversion-processing section to apply a conversion-processing to unsharp image-signals, generated from said original image-signal in respect to a plurality of frequency bands, so as to generate converted unsharp image-signals;

a differential processing section to generate differential image-signals obtained from differences between said unsharp image-signals and said converted unsharp image-signals; and

an addition-processing section to totally add said differential image-signals to generate said high-frequency component signal of said original image-signal.

2. The image-processing apparatus of claim 1,

wherein said differential image-signals derive from either differences between said unsharp image-signals in an

adjacent pair of said frequency-bands or differences between said original image-signal and said converted unsharp image-signals.

3. The image-processing apparatus of claim 1,

wherein said conversion-processing is to convert pixel values of said unsharp image-signals, based on a non-linear transform.

4. The image-processing apparatus of claim 1,

wherein said conversion-processing is determined by said original image-signal or said unsharp image-signals in said plurality of frequency-bands.

5. The image-processing apparatus of claim 1,

wherein said conversion-processing is determined by said original image-signal or said unsharp image-signals in adjacent pairs of frequency-bands.

6. The image-processing apparatus of claim 1,

wherein said conversion-processing varies depending on either one of pixel value of said unsharp image-signals

employed for generating said differential image-signals or pixel values of said original image-signal.

7. The image-processing apparatus of claim 1,

wherein said conversion-processing varies depending on said unsharp image-signals.

8. The image-processing apparatus of claim 1,

wherein said conversion-processing is a suppression-processing for suppressing an averaging-processing for averaging image-signals.

9. The image-processing apparatus of claim 1,

wherein said conversion-processing varies depending on pixel values of said unsharp image-signals to be processed by said conversion-processing.

10. The image-processing apparatus of claim 1,

wherein said conversion-processing varies depending on pixel values of a unsharp image-signal at a lowest frequency-band.

11. The image-processing apparatus of claim 1,

wherein said conversion-processing varies depending on pixel values of said original image-signal.

12. The image-processing apparatus of claim 8,

wherein the lower a frequency-band in which said unsharp image-signals reside is, the greater a degree of suppressing said averaging-action for averaging said image-signals in said suppression-processing is.

13. The image-processing apparatus of claim 8,

wherein the higher a frequency-band in which said unsharp image-signals reside is, the stronger a power of suppressing said averaging-action for averaging said image-signals in said suppression-processing is.

14. An image-processing apparatus, in which a compensation-signal generated from a low-frequency component signal of an original image-signal, representing a plurality of pixels, is added to either said original image-signal or a lowest frequency image-signal of said original image-signal, in order to generate a processed image-signal, comprising:

a conversion-processing section to apply a conversion-processing to unsharp image-signals, generated from said

original image-signal in respect to a plurality of frequency bands, so as to generate converted unsharp image-signals;

a differential processing section to generate differential image-signals obtained from differences between said unsharp image-signals and said converted unsharp image-signals; and

a compensation-signal calculating section to totally add said differential image-signals so as to generate a high-frequency component signal, and to calculate said compensation-signal by subtracting said low-frequency component signal form a converted low-frequency component signal, which is derived from a difference between said high-frequency component signal and said original image-signal.

15. The image-processing apparatus of claim 14,

wherein said differential image-signals are derived from either differences between said unsharp image-signals in adjacent pairs of said frequency-bands or differences between said original image-signal and said converted unsharp image-signals.

16. The image-processing apparatus of claim 14,

wherein said conversion-processing is to convert pixel values of said unsharp image-signals, based on a non-linear transform.

17. The image-processing apparatus of claim 14,

wherein said conversion-processing is determined by said original image-signal or said unsharp image-signals in said plurality of frequency-bands.

18. The image-processing apparatus of claim 14,

wherein said conversion-processing is determined by said original image-signal or said unsharp image-signals in an adjacent pair of frequency-bands.

19. The image-processing apparatus of claim 14,

wherein said conversion-processing varies depending on either one of pixel value of said unsharp image-signals employed for generating said differential image-signals or pixel values of said original image-signal.

20. The image-processing apparatus of claim 14,

wherein said conversion-processing varies depending on said unsharp image-signals.

21. The image-processing apparatus of claim 14,

wherein said conversion-processing is a suppression-processing for suppressing an averaging-processing for averaging image-signals.

22. The image-processing apparatus of claim 14,

wherein said conversion-processing varies depending on pixel values of said unsharp image-signals to be processed by said conversion-processing.

23. The image-processing apparatus of claim 14,

wherein said conversion-processing varies depending on pixel values of a unsharp image-signal at a lowest frequency-band.

24. The image-processing apparatus of claim 14,

wherein said conversion-processing varies depending on pixel values of said original image-signal.

25. The image-processing apparatus of claim 21,

wherein the lower a frequency-band in which said unsharp image-signals reside is, the greater a degree of

suppressing said averaging-processing for averaging said image-signals in said suppression-processing is.

26. The image-processing apparatus of claim 21,

wherein the higher a frequency-band in which said unsharp image-signals reside is, the stronger a power of suppressing said averaging-action for averaging said image-signals in said suppression-processing is.

27. An image-processing apparatus, comprising:

an unsharp image-signal generating section to generate unsharp image-signals from an original image-signal in respect to a plurality of frequency-bands;

a differential processing section to generate differential image-signals from differences between said original image-signal and said unsharp image-signals, and to apply a conversion-processing to said differential image-signals so as to generate converted differential image-signals; and

an addition processing section to add said converted differential image-signals to said original image-signal or a lowest frequency image-signal to generate a processed image-signal;

wherein said conversion-processing varies depending on pixel values of said unsharp image-signals.

28. The image-processing apparatus of claim 27, further comprising:

a compensation-signal calculating section to generate a compensation-signal which is derived from a low-frequency component signal obtained by subtracting a total sum of said converted differential image-signals from said original image-signal;

wherein said addition processing section adds said compensation-signal, instead of said converted differential image-signals, to said original image-signal or said lowest frequency image-signal to generate said processed image-signal.

29. The image-processing apparatus of claim 28,

wherein said differential image-signals derive from either differences between said unsharp image-signals in adjacent pairs of said frequency-bands or differences between said original image-signal and said unsharp image-signals.

30. The image-processing apparatus of claim 28,

wherein said differential image-signals on which said conversion-processing depends are either anyone of image-signals utilized for obtaining said differential image-signals or both of them.

31. The image-processing apparatus of claim 28,

wherein said conversion-processing applied to said differential image-signals varies depending on said differential image-signals.

32. The image-processing apparatus of claim 28,

wherein said conversion-processing applied to said differential image-signals is a suppression-processing for suppressing an absolute pixel value at least at a part of image-signals.

33. The image-processing apparatus of claim 32,

wherein the lower a frequency-band in which said differential image-signals reside is, the stronger a power of suppressing said absolute pixel value of said image-signals in said suppression-processing is.

34. The image-processing apparatus of claim 32,

wherein the higher a frequency-band in which said differential image-signals reside is, the stronger a power of suppressing said absolute pixel value of said image-signals in said suppression-processing is.

35. The image-processing apparatus of claim 28,

wherein a conversion-function is determined by designating a frequency characteristic, so as to realize a given frequency characteristic, and processing are conducted on the basis of said conversion-function.

36. The image-processing apparatus of claim 35,

wherein said frequency characteristic can be changed depending on density.

37. The image-processing apparatus of claim 35,

wherein said frequency characteristic can be changed depending on density of either said original image-signal or said unsharp image-signals for every differential image-signal.

38. The image-processing apparatus of claim 35,

wherein sets of parameters for processing said frequency characteristic are provided in said image-processing apparatus, a kind of processing can be designated by selecting one set out of said sets of parameters.

39. An image-processing apparatus, comprising:

a filter-processing section to apply a mask-processing to an original image-signal, representing a plurality of pixels, with a mask so as to generate filtered original image-signals;

an unsharp image-signal generating section to generate unsharp image-signals from said filtered original image-signals;

a differential processing section to generate differential image-signals from differences between said original image-signal and said unsharp image-signals, or from differences between said unsharp image-signals themselves; and

an addition processing section to add said differential image-signals to said original image-signal or a lowest frequency image-signal with respect to said original image-signal in order to generate a processed image-signal;

wherein a frequency characteristic of said processed image-signal can be varied by changing a frequency characteristic of said mask employed for said mask-processing.

40. The image-processing apparatus of claim 39, further comprising:

a compensation-signal calculating section to generate a compensation-signal which is derived from a low-frequency component signal obtained by subtracting a total sum of said differential image-signals from said original image-signal;

wherein said addition processing section adds said compensation-signal, instead of said differential image-signals, to said original image-signal or said lowest frequency image-signal to generate said processed image-signal.

41. The image-processing apparatus of claim 40,

wherein said mask-processing is repetitions of filtering-processing with a specific filter.

42. The image-processing apparatus of claim 41,

wherein said mask employed for said repetitions of filter-processing is a simple average.

43. The image-processing apparatus of claim 41,

wherein said mask employed for said repetitions of filter-processing is a simple average of 2 pixels × 2 pixels.

44. The image-processing apparatus of claim 40,

wherein a number of said repetitions of filter-processing designates said frequency characteristic of said processed image-signal.

45. The image-processing apparatus of claim 40,

wherein said frequency characteristic of said processed image-signal is specified by designating weight of said mask with variance values of a normal distribution, and a number of said repetitions of filter-processing, which is approximate to said variance values of said normal distribution, is calculated to process image-signals.

46. The image-processing apparatus of claim 40,

wherein said mask-processing varies depending on said unsharp image-signals.

47. The image-processing apparatus of claim 40,

wherein said mask-processing varies depending on said original image-signal.

48. The image-processing apparatus of claim 40,

wherein said mask-processing varies depending on a frequency characteristic of said original image-signal.

49. An image-processing apparatus, comprising:

an unsharp image-signal generating section that employs a pyramid algorithm to generate a plurality of unsharp image-signals, resolutions of which are different relative to each other, from a original image-signal representing a plurality of pixels;

a differential processing section to generate differential image-signals from differences between said original image-signal and said unsharp image-signals, or from differences between said unsharp image-signals themselves; and

an addition processing section to add said differential image-signals to said original image-signal or a lowest

frequency image-signal with respect to said original image-signal in order to generate a processed image-signal;

wherein a frequency characteristic of said processed image-signal can be varied by changing an interpolation-processing method for adding or subtracting said unsharp image-signals.

50. The image-processing apparatus of claim 49, further comprising:

a compensation-signal calculating section to generate a compensation-signal which is derived from a low-frequency component signal obtained by subtracting a total sum of said differential image-signals from said original image-signal;

wherein said addition processing section adds said compensation-signal, instead of said differential image-signals, to said original image-signal or said lowest frequency image-signal to generate said processed image-signal.

51. The image-processing apparatus of claim 50,

wherein said interpolation-processing is repetitions of filter-processing with a specific filter.

52. The image-processing apparatus of claim 51,

wherein a mask employed for said repetitions of filter-processing is a simple average.

53. The image-processing apparatus of claim 51,

wherein a mask employed for said repetitions of filter-processing is a simple average of 2 pixels × 2 pixels.

54. The image-processing apparatus of claim 50,

wherein a number of said repetitions of filter-processing designates said frequency characteristic of said processed image-signal.

55. The image-processing apparatus of claim 50,

wherein said interpolation-processing is performed on the basis of a sampling function of said original image-signal.

56. The image-processing apparatus of claim 50,

wherein said interpolation-processing is a linear-interpolation processing.

57. The image-processing apparatus of claim 50,

wherein said interpolation-processing is a spline-interpolation processing.

58. The image-processing apparatus of claim 50,

wherein said interpolation-processing varies depending on a frequency band of a interpolated image-signal.

59. The image-processing apparatus of claim 50,

wherein said interpolation-processing varies depending on said original image-signal.

60. The image-processing apparatus of claim 50,

wherein said interpolation-processing varies depending on a frequency characteristic of said original image-signal.

61. An image-processing apparatus, comprising:

an unsharp image-signal generating section that employs a pyramid algorithm to generate a plurality of unsharp image-signals, resolutions of which are different relative to each other, from a original image-signal representing a plurality of pixels;

a differential processing section to generate differential image-signals from differences between said

original image-signal and said unsharp image-signals, or from differences between said unsharp image-signals themselves; and

an addition processing section to add said differential image-signals to said original image-signal or a lowest frequency image-signal with respect to said original image-signal in order to generate a processed image-signal;

wherein a mask-processing is employed for generating said unsharp image-signals in a process of said pyramid algorithm, and a reduction rate of said unsharp image signals, caused by a down sampling-processing, varies depending on a frequency characteristic of a mask.

62. The image-processing apparatus of claim 61, further comprising:

a compensation-signal calculating section to generate a compensation-signal which is derived from a low-frequency component signal obtained by subtracting a total sum of said differential image-signals from said original image-signal;

wherein said addition processing section adds said compensation-signal, instead of said differential image-signals, to said original image-signal or said lowest

frequency image-signal to generate said processed image-signal.

63. The image-processing apparatus of claim 62,

wherein said mask-processing is repetitions of filtering-processing with a specific filter.

64. The image-processing apparatus of claim 62,

wherein said mask employed for said repetitions of filter-processing is a simple average.

65. The image-processing apparatus of claim 62,

wherein said mask employed for said repetitions of filter-processing is a simple average of 2 pixels × 2 pixels.

66. The image-processing apparatus of claim 62,

wherein said mask-processing varies depending on said unsharp image-signals.

67. The image-processing apparatus of claim 62,

wherein said mask-processing varies depending on said original image-signal.

68. The image-processing apparatus of claim 62,

wherein said mask-processing varies depending on a frequency characteristic of an original image-signal.

69. The image-processing apparatus of claim 62,

wherein a variation of said frequency characteristic of said mask or a change of an interpolation-processing is determined by designating a frequency characteristic.

70. The image-processing apparatus of claim 69,

wherein said designated frequency characteristic can be changed depending on a density of said original image-signal or said unsharp image-signals.

71. The image-processing apparatus of claim 69,

wherein said designated frequency characteristic can be changed depending on a density of said original image-signal or said unsharp image-signals for each of said unsharp image-signals and said differential image-signals.

72. The image-processing apparatus of claim 39,

wherein sets of parameters for processing said frequency characteristic are provided in said image-

processing apparatus, a kind of processing can be designated by selecting one set out of said sets of parameters.

73. An image-processing apparatus, comprising:

an unsharp image-signal generating section to generate a plurality of unsharp image-signals from a original image-signal, representing a plurality of pixels;

a differential processing section to generate differential image-signals from said unsharp image-signals or said original image-signal; and

an addition processing section to add said differential image-signals to said original image-signal or a lowest frequency image-signal with respect to said original image-signal in order to generate a processed image-signal;

wherein repetitions of filter-processing with a specific filter are conducted for generating said unsharp image-signals.

74. The image-processing apparatus of claim 73, further comprising:

a compensation-signal calculating section to generate a compensation-signal which is derived from a low-frequency

component signal obtained by subtracting a total sum of said differential image-signals from said original image-signal;

wherein said addition processing section adds said compensation-signal, instead of said differential image-signals, to said original image-signal or said lowest frequency image-signal to generate said processed image-signal.

75. The image-processing apparatus of claim 73,

wherein a mask employed for said repetitions of filter-processing is a simple average.

76. The image-processing apparatus of claim 73,

wherein a mask employed for said repetitions of filter-processing is a simple average of 2 pixels × 2 pixels.

77. The image-processing apparatus of claim 73,

wherein a mask-processing varies depending on said unsharp image-signals.

78. The image-processing apparatus of claim 73,

wherein a mask-processing varies depending on said original image-signal.

79. The image-processing apparatus of claim 73,

wherein a mask-processing varies depending on a frequency characteristic of said original image-signal.

80. The image-processing apparatus of claim 76,

wherein a number of repetitions of said single average of 2 pixels × 2 pixels is not less than 16.

81. The image-processing apparatus of claim 76,

wherein a number of repetitions of said single average of 2 pixels × 2 pixels is not less than 8.